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IDAHO WATER SUPPLY PROGRAM EVALUATION

Environmental Protection Agency
Seattle, Washington

October 1973

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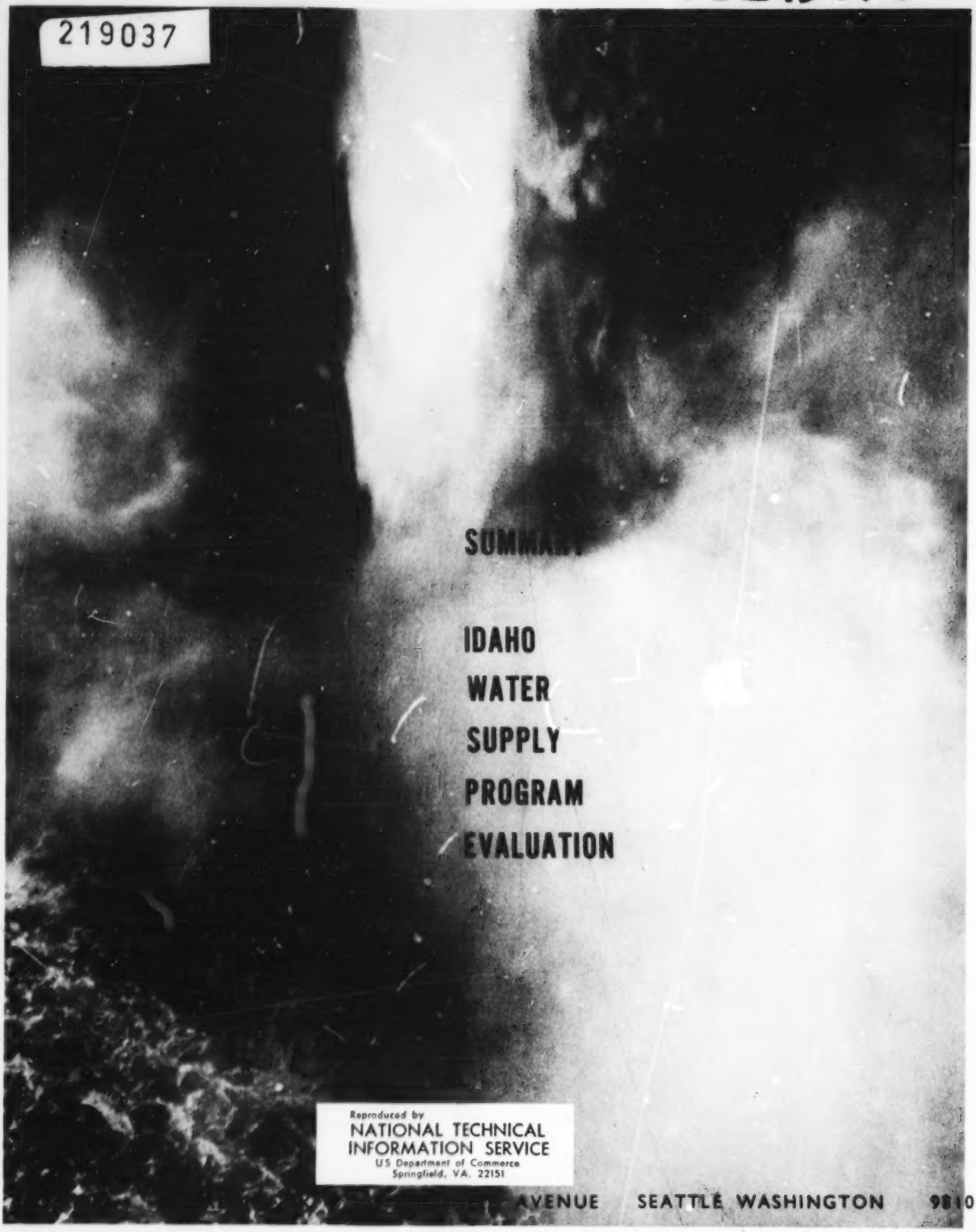

SUMMARY

IDAHO WATER SUPPLY PROGRAM EVALUATION

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SUMMARY

IDAHO WATER SUPPLY PROGRAM EVALUATION

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Water Supply Unit

Municipal Section

Air & Water Programs Division

Environmental Protection Agency

Region X

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U.S. Environmental Protection Agency
Region X Air & Water Programs Division
Water Supply Unit
1200 Sixth Avenue
Seattle, WA 98101

10. Project/Task/Work Unit No.

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Seattle, WN 98101

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PREFACE

Information contained in this SUMMARY has been condensed from the full report, IDAHO WATER SUPPLY PROGRAM EVALUATION. Significant study findings and major recommendations needed to give Idaho an effective public water supply program are presented. More detailed information concerning the quality and surveillance of public drinking water in Idaho is included in the full report which is available from the Idaho Department of Environmental and Community Services or the Environmental Protection Agency.

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INTRODUCTION

The great strides made in water treatment in past years have reduced the threat of the once feared major water-borne epidemics. With this technological advancement has come a sense of assurance that our drinking water supplies are failsafe and free from potential health hazards. This false sense of security is reflected not only by the average citizen, but has spread to portions of the water supply industry itself. Many supplies have become victims of their own success. They have maintained a status quo without concern for improving the reliability of their system or for meeting the challenge of newer and more stringent quality standards.

The Community Water Supply Study (1) indicated that complacency is not restricted solely to the citizenry and utilities, but has spread also to the regulatory agencies. In general, state agencies are much less active in drinking water supply surveillance today than in past years. Program emphasis and resources have been reallocated to meet the demands of new pollution control mandates. Although extensive water pollution control efforts can provide improved raw water quality, these programs alone do not assure safety or reliability of drinking water. Such assurance is attainable only through renewed awareness of the public health significance of drinking water and the

establishment of active water supply programs at the state and local levels.

Recognizing this, James L. Agee, Region X Administrator, Environmental Protection Agency, when requested by the Honorable Cecil D. Andrus, Governor of the State of Idaho, to assist in supporting environmental programs in Idaho, recommended as part of a total environmental program assessment package an evaluation of the State's water supply activities. Subsequent correspondence and discussion with State water supply program personnel resulted in establishment of an agreement for the evaluation, the purposes of which were:

1. To ascertain the condition of Idaho's water supplies through field surveys of water supply systems, laboratory analyses of drinking water samples for bacteriological, chemical and radiochemical constituents, and examination of pertinent data recorded in the State files,

2. To determine the adequacy of legal statutes, regulations and policies, budget and manpower resources, surveillance activities, laboratory support, and operator training,

3. To evaluate the effectiveness of the Idaho water supply program as determined by the condition of a representative number of the State's water supplies, and

4. To recommend improvements and additions which may be needed to assure an adequate supply of safe drinking water for residents of Idaho.

Field surveys to determine the adequacy of water system facilities, water quality, State laboratory facilities and operations, and overall public water supply surveillance were conducted in late 1971 and early 1972. Additional information concerning subsequent legislation affecting the water supply program, recent organizational changes establishing the Department of Environmental and Community Services, and manpower and funding expenditures for public water supply surveillance through Fiscal Year 1973 has been included.

PLAN OF STUDY

WATER SUPPLIES SURVEYED

Resident population in Idaho, according to the 1970 census, is 713,000. Approximately 482,000 of these people, or 68 percent of the State's population, are served by 274 public water supplies. The health of this segment of the State's population is directly affected by the quality of their drinking water. Under State law the Department of Environmental and Community Services is responsible for establishing requirements and providing surveillance of these supplies to assure safe drinking water. In addition to the public supplies, there is an unknown number of systems, generally designated semi-public, which serve State residents and the traveling public at restaurants, service stations, recreation facilities, trailer courts and similar establishments. Presently these supplies are neither listed nor under surveillance by the State.

To accomplish the system evaluation objective, the 274 public water supplies were divided into five population groups as shown in Table 1. Twenty-eight supplies representing 10 percent of the State's public water systems were selected at random to represent the respective percentage of supplies within the predetermined population groupings. The random selection was examined and found acceptable from the standpoint of geographical distribution, type

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of source and type of treatment. Location of the supplies is shown in Figure 1.

State dental health records indicate fourteen (14) of the 274 public water supply systems in Idaho adjust the fluoride content of their water for dental health protection. A special fluoride study was conducted of all fourteen supplies. Figure 2 shows the location of the fluoridated systems surveyed.

PROGRAM EVALUATION

The effectiveness of the Idaho water supply program in protecting the public health was judged on:

1. Evaluation of State statues pertaining to protection of the State's water resource for drinking purposes to determine if sufficient policy and regulation setting power is available to conduct its activities properly,

2. Review of regulations and policies adopted by the Department of Environmental and Community Services to determine their adequacy with respect to current good water supply practice,

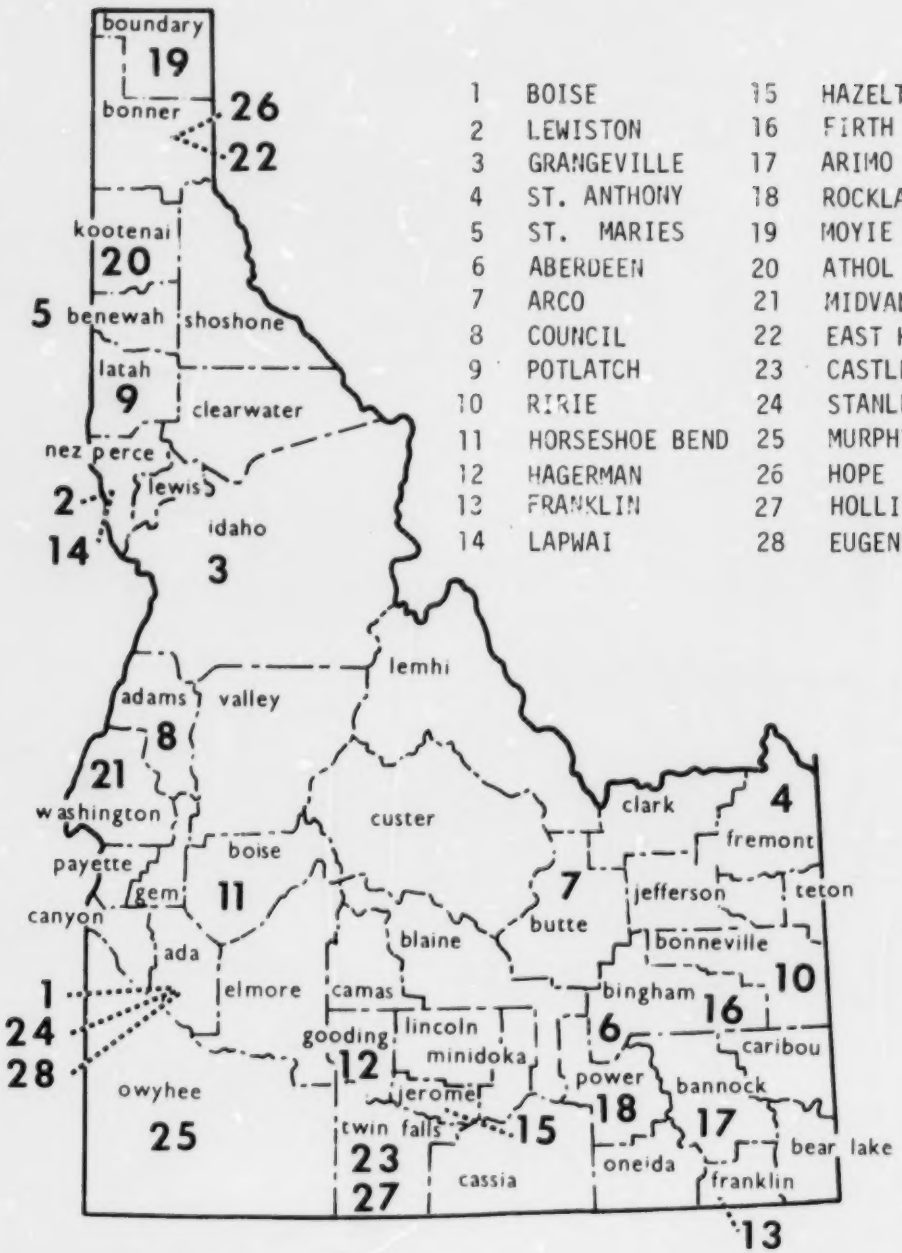
3. Evaluation of the Department's routine bacteriological, chemical, and facility surveillance program through review of available records and selected field surveys,

4. Review of other program activities such as operator training and certification, cross-connection control, fluoridation and technical assistance to other State and local agencies concerned with water supply,

TABLE 1

SELECTION OF PUBLIC WATER SUPPLIES

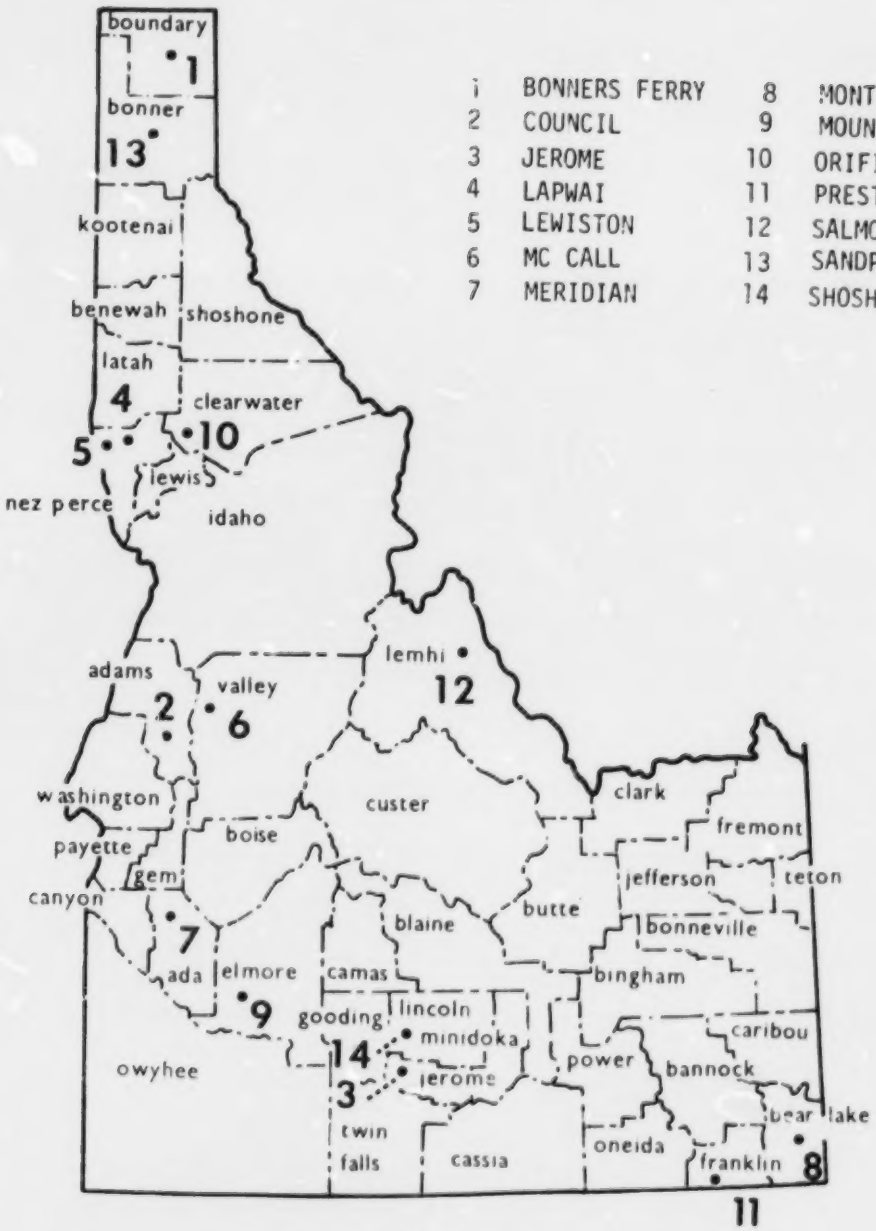
POPULATION GROUP	POPULATION SERVED	NUMBER OF SYSTEMS	% SYSTEMS	(% SYSTEMS)(28)	NUMBER SELECTED
Over 25,000	152,500	3	1.1	0.3	1
5,000 - 25,000	150,081	12	4.4	1.2	1
1,000 - 5,000	120,597	53	19.3	5.4	5
500 - 1,000	28,170	42	15.3	4.3	4
Under 500	30,551	164	59.9	16.8	17
TOTAL	481,899	274	100.0	28.0	28



1	BOISE	15	HAZELTON
2	LEWISTON	16	FIRTH
3	GRANGEVILLE	17	ARIMO
4	ST. ANTHONY	18	ROCKLAND
5	ST. MARIES	19	MOYIE SPRINGS
6	ABERDEEN	20	ATHOL
7	ARCO	21	MIDVALE
8	COUNCIL	22	EAST HOPE
9	POTLATCH	23	CASTLEFORD
10	RIRIE	24	STANLEY POND W.A.
11	HORSESHOE BEND	25	MURPHY
12	HAGERMAN	26	HOPE
13	FRANKLIN	27	HOLLISTER
14	LAPWAI	28	EUGENE OUTLOOK W.A.

FIGURE 1

PUBLIC WATER SUPPLY SYSTEMS SURVEYED



1 BONNERS FERRY
2 COUNCIL
3 JEROME
4 LAPWAI
5 LEWISTON
6 MC CALL
7 MERIDIAN
8 MONTPELIER
9 MOUNTAIN HOME
10 ORIFINO
11 PRESTON
12 SALMON
13 SANDPOINT
14 SHOSHONE

FIGURE 2

FLUORIDATED WATER SUPPLY SYSTEMS IN IDAHO

5. Evaluation of the Department's bacteriological and chemical laboratories to determine their capability to provide adequate support for the water supply program,

6. Comparison of budget and manpower allocations for the present program with those considered minimal for operation of an adequate program, and

7. Evaluation of the Department's organizational structure and the water supply program's relationship to the Health Districts.

The following specific criteria were used in evaluating the components of the program noted above. Bacteriological and chemical water quality was judged against the criteria of the U.S. Public Health Service Drinking Water Standards, 1962 edition (2), (hereinafter referred to as the Drinking Water Standards). Water supply system facilities were evaluated against recommendations of the Manual for Evaluating Public Drinking Water Supplies (3). Laboratory operations were compared with recommended practices of Standard Methods for the Examination of Water and Wastewater, 13th Edition (4). Legislative authority, rules and regulations, program operations, and budget and staffing levels were reviewed against guidelines developed by EPA through evaluation of state water supply surveillance programs nationwide.

STUDY FINDINGS

WATER SUPPLY SYSTEM STATUS

The 28 water supplies surveyed provide drinking water to approximately 1/5 of Idaho's population served by the public water supplies and are judged to be representative of public supplies throughout the State. The findings of the survey are presented below by major categories examined.

Water Quality - Bacteriological

Bacteriological testing is essential to determine if drinking water is safe. The Drinking Water Standards recognize the coliform organism group as a reliable indicator of the bacteriological quality of drinking water. The presence of coliform organisms in the distribution system suggests either inadequate treatment or access of contaminants to the water after treatment. Failure to meet the bacteriological quality standards indicates that the water is a potential carrier of infectious disease. Such a situation is a serious potential health hazard and calls for immediate corrective action.

Of the Idaho systems examined, 21 (75 percent) either did not meet the bacteriological quality standards two or more months during the twelve-month period prior to the survey, or failed to collect sufficient samples

during this same period to assess the bacteriological quality. These systems serve a combined population of 13,750. Considering only those water samples collected during the survey, five systems (18 percent) failed to meet the bacteriological quality criteria of the Drinking Water Standards. Comparison of bacteriological sampling results to system size indicates that smaller water systems in Idaho generally distribute water of poorer bacteriological quality.

Water Quality - Chemical

Drinking water should not contain substances which are toxic or may cause adverse health effects. The Drinking Water Standards establish mandatory chemical limits for these substances. Supplies or individual sources from which samples have been confirmed as failing to meet these standards should be rejected.

One of the public water supply systems (4 percent) examined in Idaho did not meet mandatory chemical drinking water standards. The system failing to meet the mandatory chemical standard serves a population of approximately 400.

Good quality drinking water should not contain substances

which adversely affect its appearance, odor and taste, or which cause discomfort to man. The Drinking Water Standards set recommended chemical limits to assure that drinking water contains no substance in concentrations which would render it undesirable or aesthetically inferior. A supply or source of water failing to meet these standards should be considered for treatment or used as standby for alternate higher quality sources.

> Seven Idaho water systems (25 percent) failed to meet one or more of the recommended chemical limits. These systems serve a combined population of over 80,000.

Facilities and Operation

Water supply facilities include all structures and equipment utilized for collection, treatment, storage and distribution of drinking water from the source to the customer's tap. These facilities and their operation must be capable of consistently producing adequate quantities of safe drinking water and preventing contamination from entering the system. Any condition, device or operational practice which allows water of questionable quality to be provided to the consumer constitutes a potential health hazard.

> Fourteen Idaho systems (50 percent) had inadequate protection of the sources against contamination.

Nine of these fourteen supplies also were found to have either inadequate treatment or none at all. Ten Idaho systems (36 percent) need either additional treatment facilities or improved protection of the source of supply.

Eleven Idaho systems (39 percent) had inadequate distribution system facilities or need improved operation of existing facilities.

Twenty-seven Idaho systems (96 percent) were providing inadequate quality control to assure protection of the water supplied. A number of the larger supplies were providing appropriate bacteriological and chemical testing and were maintaining operating records. Only one supply was judged to be carrying out an adequate cross-connection control program. Most of the smaller supplies were deficient in two or more of these areas.

Twenty Idaho systems (71 percent) employed operators who had never participated in any water supply operators short course training. Many operators, although aware of their lack of knowledge on critical public health aspects of water supply operations, felt they could not be away from the job for even short course training.

Only two (25 percent) of the eight Idaho fluoridation installations in operation at the time of the survey were providing a fluoride content in the range recommended by the State for maximum dental health benefits.

Four (50 percent) of the eight operating Idaho fluoridation installations had unsatisfactory storage of chemical compounds and inadequate fluoride feed equipment.

None of the eight operating Idaho fluoridation installations was providing complete analytical control of the fluoride feed level.

Surveillance

Surveillance of water supply systems is one of the essential responsibilities of a state health agency. It requires routine monitoring of bacteriological and chemical water quality to detect possible contamination, and regular review of system facilities and operational procedure to prevent serious health hazards from developing.

There is no complete, updated inventory of all the Idaho public water supplies for which the Department of Environmental and Community Services is responsible.

Twenty-two (78 percent) of the Idaho systems evaluated had not been subject to a sanitary survey within the

previous 12 months. The average period since the last sanitary servey was over seven years.

Nineteen Idaho systems (68 percent) failed to collect the required number of bacteriological samples two or more months of the previous 12-month reporting period. Little resampling or investigation was done as a follow-up to samples showing contamination.

Twenty Idaho systems (71 percent) had not received a chemical analysis within the previous three years. The average period since the last chemical analysis was nine years. Those analyses which were completed did not include important health parameters such as arsenic, cadmium, chromium, cyanide, lead, selenium and silver.

No routine surveillance has been provided for Idaho communities which adjust the fluoride level in their water supply. Little surveillance of bottled water or bottling operations in Idaho has been provided.

WATER SUPPLY PROGRAM

The conditions of water supply facilities and drinking water quality are directly related to the implementation of adequate regulatory powers and the provisions of training and technical assistance programs for water supply operators. The generally poor public health conditions and practices found in the field survey are largely attributable to the lack of an aggressive water supply program at the State and local levels. Significant features of the State program are described below.

Authority, Regulations and Standards

The Idaho statues give broad authority to the Board of Environmental and Community Services for regulation of public water supplies. Administrative responsibility for implementing these acts is vested in the Administrator of the Department of Environmental and Community Services.

Regulations governing protection of public water supply were issued in 1964. These regulations, Idaho Drinking Water Standards (5), adopt the U.S Public Health Service Drinking Water Standards, 1962 Edition, and provide standards for design and construction of drinking water system facilities. In addition, minimum well construction standards were adopted by the Department of Water Administration in 1968 and all water well contractors are required to be licensed. These two sets of regulations

are generally adequate to permit operation of an acceptable public water supply program.

Organization, Manpower and Budget

Considerable reorganization of health and social service agencies has occurred recently in Idaho. At the time of the field surveys in 1971-1972 the water supply program was organizationally located in the Department of Health. At that time the water supply activity was not an identifiable unit within the parent organization. General program direction was provided by the Chief of the Engineering Division and field work was accomplished by individuals in the three Health Department Regional Offices. The total manpower allocations for water supply surveillance and technical assistance in fiscal years 1971 and 1972 were 1.0 man-year. Estimated expenditures for field activities were $22,000. Laboratory support increased total water supply program expenditures to $91,000 per year.

Action by the 1972 and 1973 Idaho legislatures resulted in reorganization of the State health programs and establishment of the Department of Environmental and Community Services. General water supply program direction is now provided by the Director of Categorical Programs with field work being carried out by the regional offices staff under direction of the Director of Regional Operations. Manpower allocations for water supply

activities increased to 2.7 man-years in fiscal year 1973. Total expenditures, including laboratory support, increased to $124,000. Although these increases have improved the State's water supply surveillance activities over that at the time of the field survey, the overall effort remains inadequate and the water supply program is not yet considered to be fulfilling its responsibilities.

The State has not delegated to the local Health Districts any portion of the responsibility for enforcement of the State public water supply regulations. Informal working agreements have evolved between certain Health Districts and the State regional engineers. However, the ultimate potential for fully utilizing the Health Districts in selected areas of surveillance and enforcement of water supply regulations has yet to be developed.

Engineering Activities

Few formal inspections and follow-up surveys of water system facilities along with limited review of water quality and operating records have resulted in little enforcement of established standards. Enforcement is hampered, not only by lack of manpower to carry out field surveys and laboratory analyses, but also by the continued use of a time consuming, manually operated data recording and retrieval system.

Review of plans and specifications for new construction and modifications to existing water system facilities has been carried

out with some degree of regularity. This effor, along with providing technical assistance on special problems and emergencies, has accounted for the majority of the professional manpower resource allocation to water supply activities.

The Department conducts an annual three-day water supply and wastewater operators short school. Many of the smaller water system operators, who most need the training, are not being reached by this program. The State maintains voluntary operator certification programs for both water supply and wastewater operators. As of July 1973, 178 water supply operators representing 38 communities (14 percent) have been certified under this program.

Laboratory Support

Bacteriological and chemical laboratory support for the water supply program is provided by the Department's Laboratory Section. Facilities and analytical procedures were evaluated at the chemical laboratory and three of the six bacteriological laboratories. Procedures and operations were found in general compliance with recognized analytical methods. Additional emphasis will be required to provide laboratory capability to routinely analyze for toxic chemicals in drinking water.

In summary, the Idaho Department of Environmental and Community Services is not providing the surveillance and consultative services necessary to fulfill its responsibilities to protect the health of those who drink water from public systems in Idaho. It is evident that Idaho must implement an expanded water supply program with increased commitment in the overall spectrum of activities that will assure the State's residents and visitors an adequate and safe supply of drinking water.

RECOMMENDATIONS

A primary purpose of this evaluation was to propose recommendations needed to provide an effective water supply program for Idaho. To properly provide the health evaluations, engineering services, and technical assistance necessary, it is recommended that:

1. The water supply program be upgraded to a stature commensurate with its importance to the health of Idaho residents and visitors with a minimum annual budget of $239,000 allocated as follows:

a.	Engineering surveillance and activities	$128,000
b.	Laboratory services	71,000
c.	Management and overhead	40,000
		$239,000

2. The water supply program manpower resources be increased to a minimum of 6 man-years of professional staff and 2 man-years of secretarial support, to provide essential surveillance, training and program direction activities.

3. The bacteriological surveillance program be redirected to:

a. Encourage water supply purveyors to develop their own bacteriological monitoring program,

b. Charge a reasonable fee to cover the cost of routine bacteriological analyses, and

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c. Conduct a check sampling program, at State expense, to assure validity of routine sampling by purveyors.

4. The chemical surveillance program be expanded and modified to:

a. Conduct at least one complete chemical analysis on each surface water supply annually and on each ground water supply triennally, and

b. Discontinue the practice of performing chemical analyses for operational control which are considered the responsibility of the water supply purveyor.

5. Enabling legislation be adopted requiring:

a. Mandatory certification of all public water supply facility operators,

b. Coordinated planning and development of new public water supply systems and the consolidation of the large number of small suppliers in urbanized regions of the State, and

c. Fluoridation of community water supplies not containing dentally significant concentrations of natural fluorides. Enactment of this requirement should be delayed until qualified operators are available and the Department's surveillance and monitoring program improves.

6. The 1964 Idaho Drinking Water Standards be revised to:

a. Recognize recent organization changes,

b. Update water quality and monitoring criteria,

c. Incorporate special design, operation and monitoring requirements for small public water supplies and bottled water facilities,

d. Establish chlorination as the minimum treatment for all public water supplies and filtration for all surface water sources with individual cases being exempted at the discretion of the Administrator if the purveyor can demonstrate adherence to standards with disinfection alone, and

e. Reflect improved water treatment and distribution practices.

7. A program be established to document present and future policy decisions for distribution in a water supply program policy manual.

8. Surveillance of all public water supplies be increased to provide at least the minimum levels set forth in the Drinking Water Standards and the Manual for Evaluation of Public Water Supplies, including but not necessarily limited to:

a. Development and continued updating of a comprehensive inventory of public water supplies,

b. Thorough annual sanitary surveys of each system with follow-up as required,

c. Increased effort to assure minimum bacteriological sampling along with the required check samples from all supplies,

d. Establishment of a routine complete chemical sampling program for each supply,

e. Establishment of a program to encourage adoption of local cross-connection control ordinances and institution of viable surveillance programs for elimination of backflow conditions,

f. Increased emphasis on surveillance of fluoridated supplies to assure adequacy of these operations, and

g. Initiation of a surveillance program to assure that bottled water quality and bottling practices comply with established standards for food packaging and water quality.

9. Operator training be improved by:

a. The Department working more closely with the State universities and community colleges on operator entry level and upgrade training programs, and,

b. Increased program flexibility to meet the needs and schedules of both full and part-time operators.

10. Computer services be utilized for storage and retrieval of water quality data, engineering report information, monthly operating report records and inventory data.

11. A memorandum of agreement be developed with each Health District for surveillance of and technical assistance to the State's small public and recreational water supply systems.

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PARTICIPANTS

The following persons and/or agencies made major contribution to the successful completion of this study.

Study Director

William A. Mullen, Chief, Water Supply Unit
Air & Water Programs Division, EPA, Region X, Seattle

Study Advisor

Francis L. Nelson, Chief, Technical Support Branch
Surveillance and Analysis Division, EPA, Region X, Seattle

Field Evaluation

Howard L. Burkherdt, Regional Environmental Engineer,
Idaho Department of Environmental Protection & Health, Pocatello 1/

Thomas N. Hushower, Chief, Special Studies Section
Water Supply Division, EPA, Washington, D.C.

Earl F. McFarren, Supervisory Chemist, Standards Attainment Branch
Water Supply Research Laboratory, NERC, EPA, Cincinnati

William A. Mullen, Chief, Water Supply Unit
Air & Water Programs Division, EPA, Region X, Seattle

Harry D. Nash, Microbiologist, Standards Attainment Branch
Water Supply Research Laboratory, NERC, EPA, Cincinnati

Francis L. Nelson, Chief, Technical Support Branch
Surveillance and Analyses Division, EPA, Region X, Seattle

Jeffrey T. Pearlman, Dental Technician, Dental Health Section
Idaho Department of Environmental Protection & Health, Boise 1/

James E. Warren, Staff Engineer, Surveillance and Technical Assistance Section
Water Supply Division, EPA, Washington, D.C.

Arthur W. Van't Hul, Regional Environmental Engineer
Idaho Department of Environmental Protection & Health, Lewiston 1/

Jerry L. Yoder, Regional Environmental Engineer
Idaho Department of Environmental Protection & Health, Boise 1/

Laboratory Support

Fluoride Laboratory, Water Supply Division, EPA, Washington, D.C.

Cincinnati Water Hygiene Laboratory, EPA, Cincinnati, Ohio 2/

Gulf Coast Water Hygiene Laboratory, EPA, Mobile, Alabama 3/

Northeast Water Hygiene Laboratory, EPA, Narragansett, Rhode Island 3/

Northwest Water Hygiene Laboratory, EPA, Gig Harbor, Washington 3/

Southwest Radiological Health Laboratory, EPA, Las Vegas, Nevada 4/

Idaho Department of Environmental Protection & Health Laboratory, Boise 1/

Idaho Health District Laboratory, Coeur d'Alene

Idaho Health District Laboratory, Idaho Falls

Idaho Health District Laboratory, Lewiston

Idaho Health District Laboratory, Pocatello

Idaho Health District Laboratory, Twin Falls

Data Processing - Water Supply Division, Data Processing Unit, Cincinnati

Grace D. Bardo, Statistical Clerk

Arthur F. Hammonds, Computer Systems Analyst

George C. Kent, Chief, Water Quality Register Branch

Richard L. Manning, Computer Systems Analyst

Report Preparation

Karen M. Ihrig, Principal Typist

William A. Mullen, Chief, Water Supply Unit

Francis L. Nelson, Chief, Technical Support Branch

1/ Agency subsequently renamed Idaho Department of Environmental and Community Services.

2/ Laboratory subsequently renamed Water Supply Research Laboratory, National Environmental Research Center-Cincinnati.

3/ Laboratory subsequently consolidated with Water Supply Research Laboratory, NERC-Cincinnati.

4/ Laboratory subsequently renamed National Environmental Research Center-Las Vegas.

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STATE AND FEDERAL AGENCY ADDRESSES

STATE:

Idaho Department of Environmental and Community Services
Environmental Protection Division
Categorical Programs
Statehouse
Boise, Idaho 83701
Telephone: 208-384-2390

FEDERAL:

Environmental Protection Agency, Region X
Air & Water Programs Branch
Water Supply Unit
1200 Sixth Avenue
Seattle, Washington 98101
Telephone: 206-442-1216